

Research Article

Indicators of Sexual And Age Changes in Anthropometric Parameters (Between and Cross Sizes) of the Breast Cell in Schoolchildren of Andijan Region

Dildora Baxodirovna Mirzakarimova^a, Xusan Abdumutallipovich Gaffarov^b,
Yuriy Daliyevich Azizov^c, Anvar Alijonovich Soliyev^d, Baxodir Razzakov^e,
Oribjon Saydamirovich O'smonov^f

^aPhD, Associate Professor, Head of the Department of Infectious Diseases, Andijan State Medical Institute, Andijan, Uzbekistan

^bAssistant of the Department of Infectious Diseases, Andijan State Medical Institute, Andijan, Uzbekistan

^cDSc, Professor, Head of the Department of Phthisiology and Pulmonology, Microbiology, Virology and Immunology, Andijan State Medical Institute, Andijan, Uzbekistan

^dHead of the Department of Civil Defense and Military Training, Andijan State Medical Institute, Andijan, Uzbekistan

^{e,f}Senior Lecturer, Department of Civil Defense and Military Training, Andijan State Medical Institute, Andijan, Uzbekistan

Abstract

The work first studied the physical development of children aged 7 to 17 years in schoolchildren of Andijan. The results of the study indicate the ongoing process of shaping and the onset of proportional harmony, regional proportions expressing the proportionality of body segments with its components that form in second childhood, adolescence and youth. The analysis of the results made it possible to characterize the mechanisms of adaptation and development of anthropometric parameters in specific (school) conditions.

Keywords: *thorax, anthropometric measurements, and the chest circumference, the transverse size of the chest, anteroposterior size of the thorax*

Introduction

Regular measurement of anthropometric parameters of body parts in schoolchildren is of great practical and theoretical importance, as it makes it possible to control and early recognize the lag in growth and development, quickly identify the causes that contribute to this, eliminate adverse factors and, if necessary, create a set of optimal conditions for the normal development of a growing organism.

The obtained data of anthropometric parameters of body parts allow us to interpret the growth and development of mass, body length in a new way, to justify the proportional formation of longitudinal, transverse, girth dimensions of body parts, as well as to show their stability and balance in the studied age periods. These anthropometric parameters can be used in the development of new standards of physical development, reconstructive surgery, prosthetics,

forensic medicine, the development of new standards of clothing and the study of racial, ethnic and population differences.

A comparative analysis of the studied age differences in the average body size in children of individual variants of somatic development revealed not only sexual dimorphism, but also the variability of growth processes in individual somatotypes.

Regarding the child population, there is no generally accepted classification of the constitutional type and a single approach to the age at which somatotyping is possible. This is determined by the fact that in childhood, during the period of active growth and formation of the body, it is difficult to distinguish clear types due to their weak differentiation, or because of the uneven growth of individual parts of the body.

In connection with the above, one of the most important tasks of clinical pediatrics is the study of age, individual and sexual morphofunctional features of the body at different stages of ontogenesis under different specific conditions and on this basis the development of various preventive measures. This fully applies to childhood and adolescence, when the child's body is most intense to environmental factors, when the problem of individual approach in health and educational programs requires scientific justification.

The urgency of the problem and the lack of coverage in the scientific literature were the motivation for the implementation of this work. The aim of the study was to study the age and gender characteristics of the indicators of anthropometric parameters of the chest in schoolchildren of Andijan.

Materials and Methods of Research

The material of the study was practically healthy children, students of schools and academic lyceums of Andijan. A total of 2,200 children aged 7 to 17 years were examined. The study materials are presented in table 1 (appendix).

Studies of students were conducted in the school medical center. Anthropometric studies of children were carried out using the methods of R. N. Dorokhov et al. (1990) - chest, N. H. Shomirzayeva et al. (1998), I. I. Sattibayeva (1998) - circumference of the chest. Anthropometric indicators of the chest serve as indicators of the harmony of the child's development and to some extent characterize the functional state of the chest organs.

When studying the growth processes of the chest, three anthropometric indicators were measured: circumference, transverse and anterior-posterior dimensions. When studying the circumference and antero-posterior dimensions of the chest, the indicators were measured in an upright position, i.e. standing.

The circumference of the chest was measured at the levels of the axilla, nipple, base of the xiphoid process of the sternum, IX rib. When measured at the level of the axillary cavity, the measuring tape was installed on the lower border of the depression in the medial wall. At the levels of the nipple and xiphoid process of the sternum, the measuring tape crossed these points, and when measuring at the level of the IX rib, first palpation found the place of formation of the rib cartilage arc, marking the points on the right and left. The distance between these points was measured with a measuring tape at the back.

Measurements of the anterior-posterior dimensions of the chest were carried out at the levels of the axilla, nipple and xiphoid process of the sternum using a pelvis meter. When studying the transverse dimensions of the chest, the greatest distance between the points located on the trunk, at the levels of the axilla, nipple, xiphoid process, was taken. The measurements were carried out using tanamera, and the obtained data were recorded in cm

The results of the study showed that in children from 7 to 17 years of age, the chest circumference at the level of the armpit increases in boys by 1.47 times (from 61.0 ± 0.4 to 89.8 ± 0.6 cm, $P < 0.001$), in girls-by 1.45 times (from 58.1 ± 0.3 to 84.4 ± 0.5 cm, $P < 0.05$), i.e. in boys it increases by an average of 28.8 cm, in girls – by 26.3 cm (Table 6). As for the circumference of the chest at the level of the nipple, it increases in boys by 1.42 times (from 60.4 ± 0.4 to 85.9 ± 0.5 cm, $P < 0.05$), in girls-by 1.48 times (from 57.2 ± 0.3 to 84.9 ± 0.5 cm, $P < 0.05$), i.e. in boys, it increases on average by 25.5 cm, in girls-by 27.7 cm; and at the level of the base of the xiphoid process of the sternum, respectively: by 1.36 times (from 58.5 ± 0.4 to 80.0 ± 0.5 cm, $P < 0.05$), by 1.31 times (from 55.5 ± 0.3 to 72.5 ± 0.5 cm, $P > 0.05$). In boys, it increases by an average of 21.5 cm, in girls – by 17.0 cm.

Studies have shown that the growth of chest circumference at the level of the armpits the most intense increases in boys at 13, 14, 15, 16, 17 years, girls – 13, 14; on the level of the nipple, respectively: 13, 14, 15, 16, and 12, 13, 14, 16; at the level of the base of the xiphoid process of the sternum is 13, 14, 15 and 12, and 13. The growth of the transverse size of the chest at the level of the armpit in the school period in boys increases by 1.54 times (from 17.1 ± 0.3 to 26.4 ± 0.3 cm, $P > 0.05$), i.e. on average by 9.3 cm, in girls-by 1.52 times (16.2 ± 0.3 to 24.7 ± 0.3 cm, $P > 0.05$), i.e. on average by 8.5 cm (Table 7). The same size of the chest at the level of the nipple increases in boys by 1.5 times (from 17.9 ± 0.3 to 26.7 ± 0.3 cm,

$P < 0.05$), i.e. on average by 8.8 cm, in girls-by 1.42 times (from 17.2 ± 0.2 to 24.5 ± 0.3 cm, $P > 0.05$), i.e. on average by 7.3 cm. As for the transverse size of the chest at the level of the base of the xiphoid process of the sternum, it increases in boys by 1.44 times (from 18.0 ± 0.3 to 26.0 ± 0.2 cm, $P < 0.05$), i.e. on average by 8.0 cm, in girls-by 1.38 times (from 17.0 ± 0.2 to 23.5 ± 0.3 cm, $P > 0.05$), i.e. on average by 6.5 cm.

We observed that in boys the most intensive growth of the transverse dimension of the thorax at the level of the axilla was observed in 11, 12, 13, 16 years, girls – 9, 11, 12 years old; at the level of the nipple, respectively: 9, 11, 17 and 9, 10 years old; at the level of the base of the xiphoid process of the sternum – at 14, 17 and 9, 11.

The growth of the anterior-posterior size of the chest at the level of the armpit in the school period in boys increases by 1.48 times (from 11.6 ± 0.3 to 17.9 ± 0.3 cm, $P > 0.05$), i.e. increases by an average of 6.3 cm, in girls - also by 1.48 times (from 11.4 ± 0.2 to 17.0 ± 0.3 cm, $P > 0.05$), i.e. increases by an average of 5.6 cm (Table.8). The same size of the chest at the level of the nipple during the studied period in boys increases by 1.42 times (from 13.1 ± 0.3 to 18.6 ± 0.3 cm, $P < 0.05$), i.e. increases on average by 5.5 cm, in girls-by 1.37 times (from 12.7 ± 0.2 to 17.5 ± 0.3 cm, $P > 0.05$), i.e. increases on average by 4.5 cm; at the level of the base of the xiphoid process of the sternum – respectively: 1.33 times (from 13.2 ± 0.3 to 17.6 ± 0.3 cm, $P < 0.05$), i.e. on average by 4.4 cm and 1.3 times (from 12.5 ± 0.3 to 16.3 ± 0.3 cm, $P > 0.05$), i.e. on average increases by 3.8 cm.

We found that the growth of the anterior-posterior size of the chest at the level of the armpit is most intense in boys at 11, 16, 17 years, in girls-at 10, 11, 12 and 14 years.

Conclusions

The girth of the chest at the level of the armpit from 7 to 11 years is higher in boys than in girls, from 12 to 14 years – on the contrary, it is higher in girls, from 15 to 17 years – again this girth is greater in boys. As for the circumference of the chest at the level of the nipple, in 7-11 years it is more in boys than in girls; from 12 to 15 years-it exceeds in girls, and in 16-17 years-this girth slightly prevails in boys. The girth of the chest at the level of the base of the xiphoid process of the sternum in 7-8 years in girls is significantly less than in boys, then the growth rate accelerates and from 12 to 13 years becomes more in girls, from 14 years again this girth prevails in boys.

We found that the chest circumference in all measured levels at 12-14 years of age in girls is greater than in boys. The dynamics of the growth of the transverse dimensions of the chest at the level of the axilla and the base of the xiphoid process of the sternum in all studied ages in boys prevails than in girls. As for the transverse size of the chest at the level of the nipple, it should be noted that in 7 – 8 years, boys have more than girls, in 9 years – almost identical, in 10 years – in girls exceeds and from 11 years – again this size in boys exceeds girls.

Consequently, the character of the growth of the transverse dimensions of the chest at the levels of the axilla and the base of the xiphoid process of the sternum in both sexes increases, i.e. ascending, and at the level of the nipple - spasmodic. The growth dynamics of anteroposterior size of the thorax at the levels of axilla and base of the xiphoid process of the sternum throughout the school period the boys more, than girls and the character growth is "rising curve". This size on the level of the nipple in 7 - 9 years old more boys from 10 to 14 years, on the contrary, more girls, and later studied age again boys becomes greater than girls.

Table 1: Dynamics of growth of chest circumference at different levels in schoolchildren of Andijan (X±m, Min. - Max., in cm).

Age \ Parameters	At the level of the armpit (n-100)		At the level of the nipple (n-100)		At the level of the base of the xiphoid process of the sternum (n-100)	
	Boys	Girls	Boys	Girls	Boys	Girls
7 y.o	61,0±0,4 55,0-70,0	58,1±0,3 53,0-64,0	60,4±0,4 55,0-69,0	57,2±0,3 52,0-63,0	58,5±0,4 53,5-68,0	55,5±0,3 50,0-60,
8 y.o	61,97±0,34 58,5-70,0	59,97±0,37 53,0-68,0	60,88±0,34 57,5-69,0	58,55±0,34 52,0-66,0	58,4±0,32 55,0-68,0	55,49±0,27 50,0-61,0
9 y.o	64,0±0,4 ** 58,0-71,5	62,6±0,4 * 59,0-73,0	62,8±0,4 * 56,8-70,0	61,7±0,4 ** 58,0-74,0	59,2±0,4 52,0-65,5	58,5±0,4 ** 55,0-68,0
10 y.o	66,2±0,29 ** 60,0-71,3	64,15±0,26 * 57,9-68,3	64,1±0,27 58,4-70,1	62,8±0,29 54,9-67,8	60,5±0,24 * 55,8-66,2	59,9±0,29 55,1-67,9
11 y.o	68,39±0,35 ** 62,72-74,2	66,3±0,36 ** 59,8-71,9	66,2±0,29 * 59,4-71,3	64,1±0,34 57,8-71,6	63,1±0,27 ** 56,7-67,8	62,1±0,24 * 55,3-69,2
12 y.o	68,8±0,29 64,2-75,3	69,2±0,39 ** 62,9-77,5	68,2±0,4 * 61,8-74,6	68,5±0,32 *** 59,6-74,8	64,8±0,35 * 58,2-72,8	66,5±0,28 *** 56,9-73,1
13 y.o	72,3±0,31 ** 65,1-79,2	73,8±0,4 *** 64,1-78,2	71,9±0,35 ** 63,2-82,1	72,3±0,36 ** 61,2-83,2	67,6±0,4 ** 60,2-81,5	68,6±0,32 ** 58,3-80,5
14 y.o	77,9±0,9 *** 65,0-96,0	78,8±0,6 *** 70,0-90,0	75,4±0,8 ** 63,0-96,0	78,7±0,7 *** 62,0-98,0	71,4±0,8 ** 60,0-89,0	70,1±0,6 * 62,0-84,0

15 y.o	81,3±1,8 ** 68,1-98,0	80,3±2,1 * 70,5-92,1	79,5±1,2 *** 66,5-89,0	80,5±2,7 * 65,0-89,0	76,0±4,5 *** 66,0-86,0	71,2±2,3 63,1-87,0
16 y.o	85,5±1,6 *** 73,5-103,0	82,8±2,9 * 72,3-95,1	83,6±5,2 *** 71,0-98,0	83,1±2,6 * 68,0-93,2	77,5±6,1 67,0-93,5	71,9±3,1 64,3-89,1
17 y.o	89,8±0,6 *** 77,5-106,0	84,4±0,5 * 77,0-99,0	85,9±0,5 * 75,0-103,0	84,9±0,5 * 76,0-99,0	80,0±0,5 * 72,5-95,0	72,5±0,5 65,0-93,0

Note: * - $P < 0.05$; ** - $P < 0.01$; *** - $P < 0.001$, without asterisk - $P > 0.05$

Table 2: Dynamics of the growth of the transverse dimensions of the chest at different levels in schoolchildren of Andijan (X±m, Min. - Max., in cm)

Age \ Sex	at the level of the armpit (n-100)		At the level of the nipple (n-100)		At the level of the base of the xiphoid process of the sternum (n-100)	
	Boys	Girls	Boys	Girls	Boys	Girls
7 y.o	17,1±0,3 15,0-20,5	16,2±0,3 14,0-19,0	17,9±0,3 16,0-22,0	17,2±0,2 15,0-19,5	18,0±0,3 16,0-22,5	17,0±0,2 15,0-19,0
8 y.o	17,73±0,11 16,5-20,5	17,33±0,12 * 15,5-20,0	18,75±0,14 16,5-22,0	18,20±0,11 * 16,0-21,0	18,63±0,15 16,0-22,5	17,89±0,11 16,0-20,0
9 y.o	18,9±0,3 * 16,5-22,0	18,6±0,3 * 17,0-21,0	19,6±0,2 17,5-22,0	19,5±0,3 * 18,0-23,0	19,4±0,2 17,5-21,0	18,9±0,3 * 17,0-22,0
10 y.o	19,5±0,13 16,9-20,8	19,1±0,12 16,1-20,8	20,1±0,12 18,5-23,2	20,9±0,1 * 18,6-22,7	20,1±0,21 17,5-22,3	19,4±0,15 17,1-22,1
11 y.o	20,67±0,16 * 17,5-23,2	20,15±0,16 * 16,5-24,1	21,6±0,11 * 19,6-24,1	21,2±0,23 18,9-24,8	20,75±0,14 18,5-24,3	20,35±0,16 * 17,6-24,2
12 y.o	21,71±0,19 * 18,4-24,3	21,6±0,23 * 18,1-25,9	22,2±0,12 20,1-24,3	21,9±0,16 19,1-25,7	21,3±0,16 18,6-24,8	21,2±0,15 18,6-24,5
13 y.o	22,3±0,24 18,5-26,1	22,0±0,28 18,5-26,1	22,9±0,3 20,2-26,7	22,2±0,28 19,1-26,0	22,0±0,35 18,8-26,8	21,8±0,2 18,6-25,1
14 y.o	23,4±0,4 * 20,0-28,0	22,6±0,3 18,6-26,5	23,8±0,4 19,0-28,0	22,9±0,3 20,0-26,9	23,2±0,4 * 18,5-27,0	22,1±0,3 18,6-26,0
15 y.o	24,2±0,3 20,1-29,3	23,1±0,6 18,7-27,3	24,6±0,3 20,4-29,6	23,4±0,4 20,1-28,2	24,1±0,35 18,6-28,9	22,6±0,35 18,9-26,9
16 y.o	25,6±0,5 * 20,1-32,3	23,9±0,3 18,9-27,1	25,4±0,31 20,5-30,6	23,9±0,35 20,2-29,5	25,0±0,36 19,1-30,9	23,1±0,4 19,0-28,8
17 y.o	26,4±0,3 23,5-33,0	24,7±0,3 21,0-29,0	26,7±0,3 * 24,5-31,5	24,5±0,3 21,0-31,5	26,0±0,2 * 24,0-32,6	23,5±0,3 19,6-30,6

Note: * - $P < 0.05$; ** - $P < 0.01$; *** - $P < 0.001$, without asterisk - $P > 0.05$

Table 3: The growth dynamics of anterior-posterior dimensions of the thorax at various levels in schoolchildren in the city of Andijan (X±m, Min. - Max., in cm)

Level Age \ Sex	at the level of the armpit (n-100)		At the level of the nipple(n-100)		At the level of the base of the xiphoid process of the sternum (n-100)	
	Boys	Girls	Boys	Girls	Boys	Girls
7 y.o	11,6±0,3 10,0-14,0	11,4±0,2 10,0-14,0	13,1±0,3 10,5-15,5	12,7±0,2 10,5-15,0	13,0±0,3 10,5-16,0	12,5±0,3 10,0-15,0
8 y.o	12,18±0,10 11,0-13,5	11,83±0,07 10,0-13,0	13,4±0,13 12,0-15,0	13,25±0,09 11,0-14,0	13,07±0,15 11,0-15,0	12,58±0,08 11,0-14,0
9 y.o	12,9±0,3 11,5-15,5	12,2±0,3 11,0-14,0	13,6±0,3 12,5-16,0	13,5±0,3 11,5-15,0	13,2±0,3 11,5-16,0	12,9±0,3 11,0-15,0
10 y.o	13,7±0,12 * 12,0-15,6	12,8±0,12 11,8-15,3	13,9±0,12 12,0-15,6	14,02±0,14 12,3-16,4	13,7±0,14 * 11,8-15,6	13,4±0,15 * 11,3-15,3
11 y.o	14,6±0,17 * 12,8-17,3	13,5±0,14 * 12,0-16,2	14,3±0,11 13,1-16,3	14,61±0,13 12,4-16,8	14,25±0,15 12,1-16,3	13,95±0,12 11,8-15,7
12 y.o	15,4±0,12 * 13,0-18,5	15,1±0,19 ** 12,8-17,6	14,5±0,12 13,2-17,4	15,5±0,15 * 13,2-18,2	14,9±0,12 * 12,4-16,9	14,6±0,13 ** 12,0-16,4
13 y.o	15,7±0,21 13,1-18,7	15,3±0,19 12,9-17,8	15,4±0,18 * 13,9-18,6	15,95±0,17 * 14,1-19,3	15,2±0,21 12,8-18,3	15,0±0,24 12,3-18,1
14 y.o	16,1±0,4 13,0-20,5	15,6±0,3 13,0-19,0	16,5±0,4 ** 14,0-21,0	16,7±0,3 * 14,5-20,0	15,7±0,4 13,5-20,0	15,7±0,3 ** 11,0-20,0
15 y.o	16,7±0,35 13,2-21,9	16,0±0,3 13,5-20,9	17,1±0,35 14,1-22,8	16,95±0,3 14,6-22,3	16,2±0,4 13,8-21,8	15,9±0,28 12,3-21,5
16 y.o	17,2±23,3 13,5-23,8	16,6±0,35 13,7-22,5	17,8±0,5 14,1-26,5	17,2±0,35 14,7-24,5	16,9±0,35 * 14,0-23,1	16,1±0,35 13,1-23,2
17 y.o	17,9±0,3 14,0-25,6	17,0±0,3 14,0-26,0	18,6±0,3 * 15,0-27,5	17,5±0,3 15,0-26,0	17,6±0,3 * 14,6-24,8	16,3±0,3 14,0-26,5

Note: * - P < 0.05; ** - P < 0.01; *** - P < 0.001, without asterisk - P > 0.05

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